

## United States Department of Agriculture Natural Resources Conservation Service

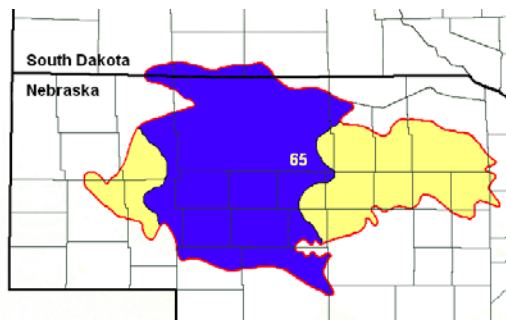
### Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Sands 17-22" P.Z.

**Site ID:** R065XY033NE

**Major Land Resource Area:**  
65 – Nebraska Sand Hills



### Physiographic Features

**Landform:** Dune

**Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2600	4000
<b>Slope (percent):</b>	3	24
<b>Water Table Depth (inches):</b>	None	None
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Very Low	Low

### Climatic Features

The mean average annual precipitation varies from 17 - 22 inches, but has varied from 13 to 27 inches in the driest to wettest season. Approximately 65 percent of the annual precipitation occurs during the growing season of mid-April to late September. The average annual snowfall varies from about 35 inches near the Platte River to about 55 inches in the Pine Ridge Area. The wind velocity is high throughout the year, averaging 10 to 12 miles per hour. Maximum wind velocities generally occur in the spring.

The average length of the growing season is 134 days, but the growing season has varied from 115 to 150 days. The average date of first frost in the fall is September 25, and the last frost in the spring is about May 14. July is the hottest month and January is the coldest. It is not uncommon for the temperature to reach 100 °F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds, producing severe cold with temperatures dropping to as low as -30 °F.

Growth of native cool season plants begins mid to late March and continues to late June. Native warm season plants begin growth in early May and continue to late August. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
<b>Frost-free period (days):</b>	131	137
<b>Freeze-free period (days):</b>	150	156
<b>Mean Annual Precipitation (inches):</b>	17	22

**Average Monthly Precipitation (inches) and Temperature (°F):**

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.31	0.52	9.1	35.1
February	0.44	0.73	13.5	41.0
March	0.75	1.41	21.3	48.6
April	1.85	2.25	31.4	61.7
May	2.88	3.65	41.5	72.1
June	3.09	3.33	51.3	82.2
July	2.77	2.92	57.4	88.2
August	2.12	2.56	55.6	86.6
September	1.56	2.02	45.2	77.7
October	1.16	1.18	33.0	66.6
November	0.44	0.75	20.5	49.6
December	0.31	0.52	11.5	39.1

<b>Climate Stations</b>		<b>Period</b>	
<b>Station ID</b>	<b>Location or Name</b>	<b>From</b>	<b>To</b>
NE2647	Ellsworth 15 NNE	1963	1997
NE6970	Purdum	1948	1997

For other climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

## Influencing Water Features

<b>Wetland Description:</b>	<u><b>System</b></u>	<u><b>Subsystem</b></u>	<u><b>Class</b></u>	<u><b>Sub-class</b></u>
None	None	None	None	None

**Stream Type:** None  
(Rosgen System)

## Representative Soil Features

The features common to all soils in this site are the sandy textured surface soils and slopes of 3 to 24 percent. The soils in this site are excessively drained and formed in eolian sand. The surface layer is 2 to 9 inches thick. The subsurface texture ranges from loamy fine sand to fine sand. Runoff as evidenced by patterns of rill, gully or other water flow is low to very low due to the very high intake rate of these soils. Cryptobiotic crusts are present, but their function is not well understood. Some pedestalling of plants occurs, but it is not very evident on casual observation and occurs on less than 5% of the plants.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Major soil series correlated to this ecological site include: Valent and Valentine.

Other soil series that have been correlated to this site include: McKelvie.

Site Type: Rangeland  
MLRA: 65 – Nebraska Sand Hills  
**Parent Material Kind:** eolian deposits  
**Parent Material Origin:** mixed  
**Surface Texture:** fine sand, loamy fine sand, sand  
**Surface Texture Modifier:** none  
**Subsurface Texture Group:** sandy

**Sands 17-22" P.Z.**  
**R065XY033NE**

**Surface Fragments  $\leq 3''$  (% Cover):** 0  
**Surface Fragments  $> 3''$  (%Cover):** 0  
**Subsurface Fragments  $\leq 3''$  (% Volume):** 2  
**Subsurface Fragments  $> 3''$  (% Volume):** 0

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	excessively	excessively
<b>Permeability Class:</b>	rapid	rapid
<b>Depth (inches):</b>	>80	>80
<b>Electrical Conductivity (mmhos/cm):</b>	0	0
<b>Sodium Absorption Ratio:</b>	0	0
<b>Soil Reaction (1:1 Water):</b>	5.6	7.3
<b>Soil Reaction (0.1M CaCl<sub>2</sub>):</b>	NA	NA
<b>Available Water Capacity (inches):</b>	3	3
<b>Calcium Carbonate Equivalent (percent):</b>	0	0

## Plant Communities

### Ecological Dynamics of the Site:

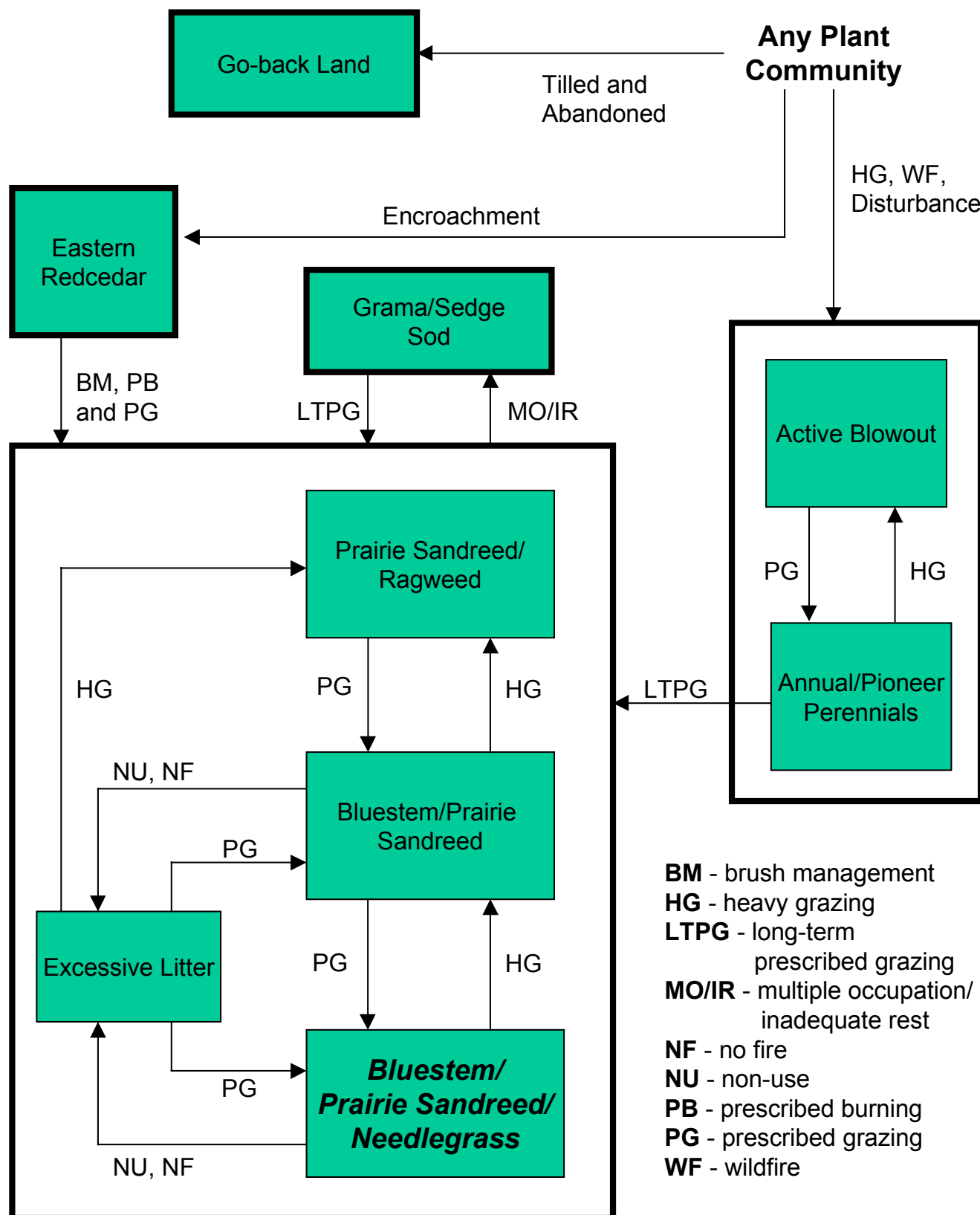
Historically, large areas of blowing sand resulted in the active movement of the sand dunes. Evaporation from the soil surface was extremely high due to the large areas of bare ground, lack of litter and sparse plant populations. The transpiration rate of these sparse plant populations was also high due to the harsh soil environment. Occasional wild fires, severe grazing by transient bison herds and drought contributed to the lack of stability of the sand dunes. This lack of stability caused the dunes to go back and forth through multiple stages of plant succession over the course of time. Early perennial plants such as sandhill muhly, blowout grass and blowout penstemon were common due to their ability to tolerate the movement of the sand and droughty conditions. As these plants began to colonize and stabilize the sand movement, other perennials such as prairie sandreed, sand bluestem, hairy grama, lemon scurfpea and rose slowly became evident on the site. Annual plants such as sandbur, Texas croton, and annual sunflower eventually colonized the areas between the perennials.

As this site deteriorates, prairie sandreed, sand dropseed, and blue grama will increase. Species such as sand bluestem and switchgrass will decrease in frequency and production. The site is extremely resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought resistance.

Interpretations are primarily based on the Bluestem/Prairie Sandreed/Needlegrass Plant Community. It has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

## Plant Communities and Transitional Pathways (diagram)



### Plant Community Composition and Group Annual Production

		Bluestem/Prairie Sandreed/Needlegrass			Bluestem/Prairie Sandreed			Prairie Sandreed/Ragweed			Excessive Litter		
COMMON/GROUP NAME	SYMBOL	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1955 - 2185	85 - 95		1500 - 1900	75 - 95		900 - 1425	60 - 95		1890 - 1995	90 - 95
sand bluestem	ANHA	1	460 - 920	20 - 40	1	300 - 800	15 - 40	1			1	315 - 735	15 - 35
prairie sandreed	CALO	2	345 - 805	15 - 35	2	200 - 400	10 - 20	2	300 - 375	20 - 25	2	210 - 630	10 - 30
little bluestem	SCSC	3	345 - 575	15 - 25	3	200 - 500	10 - 25	3			3	210 - 420	10 - 20
NEEDLEGRASS		4	115 - 345	5 - 15	4	0 - 100	0 - 5	4	0 - 75	0 - 5	4	105 - 420	5 - 20
needleandthread	HECOC8	4	115 - 345	5 - 15	4	0 - 100	0 - 5	4	0 - 75	0 - 5	4	105 - 420	5 - 20
porcupine grass	HESP11	4	0 - 46	0 - 2							4	105 - 420	5 - 20
GRAMA		5	115 - 230	5 - 10	5	100 - 200	5 - 10	5	75 - 150	5 - 10	5	0 - 105	0 - 5
blue grama	BOGR2	5	115 - 230	5 - 10	5	100 - 200	5 - 10	5	75 - 150	5 - 10	5	0 - 105	0 - 5
hairy grama	BOHI2	5	115 - 230	5 - 10	5	100 - 200	5 - 10	5	75 - 150	5 - 10	5	0 - 105	0 - 5
OTHER WARM-SEASON		6	115 - 345	5 - 15	6	200 - 300	10 - 15	6	75 - 225	5 - 15	6	210 - 315	10 - 15
switchgrass	PAVI2	6	115 - 230	5 - 10	6	100 - 200	5 - 10				6	105 - 210	5 - 10
Indiangrass	SONU2	6	0 - 115	0 - 5									
sand dropseed	SPCR	6	0 - 115	0 - 5	6	100 - 200	5 - 10	6	75 - 225	5 - 15			
sand paspalum	PASE5	6	0 - 46	0 - 2	6	0 - 100	0 - 5						
sand lovegrass	ERTR3	6	23 - 115	1 - 5							6	105 - 210	5 - 10
purple lovegrass	ERSP				6	0 - 100	0 - 5						
sandhill muhly	MUPU2				6	0 - 100	0 - 5						
NATIVE GRASS/GRASS-LIKES		7	46 - 184	2 - 8	7	40 - 200	2 - 10	7	90 - 225	6 - 15	7	21 - 105	1 - 5
Indian ricegrass	ACHY	7	0 - 46	0 - 2									
prairie junegrass	KOMA	7	23 - 115	1 - 5	7	0 - 100	0 - 5	7	0 - 75	0 - 5	7	0 - 105	0 - 5
Scribner panicum	DIOLS	7	0 - 46	0 - 2	7	0 - 200	0 - 10	7	75 - 150	5 - 10			
sedge	CAREX	7	23 - 115	1 - 5	7	20 - 100	1 - 5	7	15 - 75	1 - 5	7	21 - 42	1 - 2
other perennial grasses	2GP	7	0 - 46	0 - 2	7	0 - 40	0 - 2	7	0 - 30	0 - 2	7	0 - 42	0 - 2
NON-NATIVE GRASSES		8			8			8	300 - 600	20 - 40	8		
cheatgrass	BRTE							8	0 - 75	0 - 5			
bluegrass	POA							8	300 - 600	20 - 40			
FORBS		9	115 - 230	5 - 10	9	100 - 300	5 - 15	9	150 - 375	10 - 25	9	42 - 105	2 - 5
gayfeather	LIATR	9	0 - 46	0 - 2	9	0 - 80	0 - 4	9	0 - 150	0 - 10	9	0 - 42	0 - 2
green sagewort	ARDR4	9	0 - 46	0 - 2	9	0 - 80	0 - 4	9	0 - 150	0 - 10	9	0 - 42	0 - 2
heath aster	SYER	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	0 - 75	0 - 5	9	0 - 21	0 - 1
Missouri goldenrod	SOMI2	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	0 - 75	0 - 5	9	0 - 21	0 - 1
penstemon	PENST	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	0 - 75	0 - 5	9	0 - 21	0 - 1
rush skeletonweed	LYJU	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	0 - 75	0 - 5	9	0 - 21	0 - 1
scurfpea	PSORA2							9	0 - 75	0 - 5			
spiderwort	TRADE	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	0 - 75	0 - 5	9	0 - 21	0 - 1
spiny phlox	PHHO										9	0 - 105	0 - 5
stiff sunflower	HEPA19	9	0 - 46	0 - 2	9	0 - 80	0 - 4	9	0 - 75	0 - 5	9	0 - 42	0 - 2
thistle	CIRSI	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	0 - 75	0 - 5	9	0 - 21	0 - 1
western ragweed	AMPS	9	0 - 23	0 - 1	9	0 - 40	0 - 2	9	150 - 300	10 - 20	9	0 - 105	0 - 5
other perennial forbs	2FP	9	0 - 46	0 - 2	9	0 - 80	0 - 4	9	0 - 75	0 - 5	9	0 - 42	0 - 2
SHRUBS		10	23 - 115	1 - 5	10	100 - 200	5 - 10	10	150 - 225	10 - 15	10	42 - 105	2 - 5
rose	ROSA5	10	23 - 69	1 - 3	10	40 - 100	2 - 5	10	30 - 150	2 - 10	10	0 - 63	0 - 3
leadplant	AMCA6	10	23 - 69	1 - 3	10	40 - 100	2 - 5	10	30 - 150	2 - 10	10	0 - 63	0 - 3
western sandcherry	PRPUB	10	23 - 69	1 - 3	10	40 - 100	2 - 5	10	30 - 150	2 - 10	10	0 - 63	0 - 3
small soapweed	YUGL	10	0 - 23	0 - 1	10	0 - 40	0 - 2	10	15 - 75	1 - 5	10	0 - 21	0 - 1
cactus	OPUNT	10	0 - 23	0 - 1	10	0 - 20	0 - 1	10	15 - 30	1 - 2	10	0 - 21	0 - 1
other shrubs	2SHRUB	10	0 - 69	0 - 3	10	40 - 100	2 - 5	10	30 - 150	2 - 10	10	0 - 63	0 - 3
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		
GRASSES & GRASS-LIKES			1570 - 2059 - 2530		1310 - 1650 - 1970		810 - 1050 - 1270		1520 - 1953 - 2580				
FORBS			110 - 173 - 250		95 - 200 - 325		145 - 263 - 400		40 - 74 - 110				
SHRUBS			20 - 69 - 120		95 - 150 - 205		145 - 188 - 230		40 - 74 - 110				
TOTAL			1700 - 2300 - 2900		1500 - 2000 - 2500		1100 - 1500 - 1900		1600 - 2100 - 2800				

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Relative value.

## Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC’s) will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

### Bluestem/Prairie Sandreed/Needlegrass Plant Community

Interpretations are primarily based on the Bluestem/Prairie Sandreed/Needlegrass Plant Community (this is also considered climax). This site evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest.

This plant community consists chiefly of tall and mid warm season grasses. Principle dominants are sand bluestem, prairie sandreed, and little bluestem. Grasses of secondary importance are needleandthread, switchgrass, sand dropseed, and hairy or blue grama. Sedges occur in the understory. Forbs and shrubs such as gayfeather, stiff sunflower, leadplant, rose and sandcherry are significant. This plant community is about 85% grasses, 10% forbs, and 5% shrubs by weight.

This plant community is extremely resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a healthy and sustainable plant community (site/soil stability, watershed function, and biologic integrity).

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6534

Growth curve name: Nebraska/South Dakota Sandhills, Native Grasslands

Growth curve description: Warm-season dominant, cool-season subdominant, mid & tall grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	5	15	25	30	10	7	3	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy grazing and/or improper rest periods will convert this plant community to the *Bluestem/Prairie Sandreed Plant Community*. Continuous heavy grazing tends to accelerate this movement.
- Non-use and no fire will convert this plant community to the *Excessive Litter Plant Community*.

### Bluestem/Prairie Sandreed Plant Community

Plants resistant to grazing are maintaining themselves in this plant community which developed under grazing by domestic livestock. Most of the palatable plants from the Bluestem/Prairie Sandreed/Needlegrass Plant Community are present but occur in lesser amounts. Warm season grasses still comprise a significant component of this plant community.

The potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% shrubs. Dominant grasses include sand bluestem, little bluestem and prairie sandreed. Grasses of secondary importance include blue or hairy grama, switchgrass, sand dropseed and Scribner’s panicum. Forbs commonly found in this plant community include gayfeather, stiff sunflower, heath aster and goldenrod. Indiangrass is no longer present and sand bluestem and perennial forbs are present in lesser amounts. This plant community has higher overall production of shrubs as compared to the Bluestem/Prairie Sandreed/Needlegrass Plant Community, and other types of shrubs are present. Excessive removal of forage will cause shrubs to increase further.

Strong healthy root systems allow production on this plant community to increase drastically with favorable precipitation. This plant community contributes to optimum soil health. This plant community is drought resistance due to its tall and mid grass diversity which allows for summer months growth. These warm-season grasses cure well for winter forage stockpiling. This plant community has slightly less litter than the Bluestem/Prairie Sandreed/Needlegrass Plant Community. This plant community is somewhat resistant to change if management remains essentially the same. However, either improved management or increased disturbance can move the plant community somewhat easily. This resiliency of this plant community is dependent on the type of management system implemented, and the intensity and duration of the disturbance.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6534

Growth curve name: Nebraska/South Dakota Sandhills, Native Grasslands

Growth curve description: Warm-season dominant, cool-season subdominant, mid & tall grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	5	15	25	30	10	7	3	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing, or prescribed grazing with periodic fire will convert the plant community to the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*. The probability of this occurring is high.
- Heavy grazing or improper rest periods will convert this plant community to the *Prairie Sandreed/Ragweed Plant Community*. High populations of gophers may cause the plant community to move to the *Prairie Sandreed/Ragweed Plant Community* as well. Continuous heavy grazing tends to accelerate this movement to the *Prairie Sandreed/Ragweed Plant Community*.
- Non-use and no fire will convert this plant community to the *Excessive Litter Plant Community*.

### **Prairie Sandreed/Ragweed Plant Community**

This plant community is established under historic heavy grazing with continued seasonal grazing starting in early May. The plant community is a mix of warm season and short cool season grasses, with an increase of forbs and shrubs. The percent ground cover increases from the Bluestem/Prairie Sandreed/Needlegrass Plant Community due to considerable encroachment by the bluegrasses.

The potential vegetation is about 60% grasses or grass-like plants, 25% forbs, and 15% shrubs. The dominant grasses include prairie sandreed, bluegrass, and sand dropseed. Other grasses present include blue or hairy grama, Scribner's panicum and needleandthread. Major forbs include western ragweed, with lesser amounts of green sagewort and gayfeather. The dominant shrubs include rose and snowberry. There is a total increase in shrubs, but a high increase of snowberry and other shrubs not present in the Bluestem/Prairie Sandreed/Needlegrass Plant Community. There is a significant increase in ragweed and Kentucky bluegrass (a shift towards cool season plants). With the exception of an increase in prairie sandreed, a dramatic decrease occurs in mid to tall warm-season grasses (sand bluestem, switchgrass, little bluestem).

The soil surface has remained intact. Total annual production is significantly reduced by 25-35%. Plant diversity and amount of litter is lower. This plant community is considered stable, but is at risk if a major shift in climate or overgrazing occurs. The resiliency of this plant community is moderate depending on the intensity and duration of disturbance. Infiltration and runoff are not greatly affected due to the nature of the soil.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6539

Growth curve name: Nebraska/South Dakota Sandhills, Native Grasslands, Disturbed

Growth curve description: Warm-season and cool-season co-dominant, short, mid and tall grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	15	20	20	20	10	7	3	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing with periodic spring only grazing, or non-use during the growing season will convert the plant community to the *Bluestem/Prairie Sandreed Plant Community*. Prescribed grazing with periodic early season prescribed burning will also convert this plant community to the *Bluestem/Prairie Sandreed Plant Community*.
- Heavy grazing or improper rest periods will convert this plant community to the *Annual/Pioneer Perennial Plant Community*. Extended drought periods (generally below average precipitation for more than 10 years) will also move the plant community to the *Annual/Pioneer Perennial Plant Community*. Continuous heavy grazing tends to accelerate this movement to the *Annual/Pioneer Perennial Plant Community*.

### Excessive Litter Plant Community

This plant community occurs after an extended period (10 - 30 years) of non-use by domestic livestock (periodic fire may extend the amount of time it will take to reach this plant community). Livestock grazing and fire has been eliminated. Litter amount has clearly increased and few or no sedges or understory plants (shortgrass) are present. There is reduced plant basal cover which is replaced by litter. Bunch grass plants tend to colonize by individual species and are very mature. These mature plants tend to have dead centers, with high individual plant vigor, and pedestalling is evident. These plants have very few tillers for vegetative reproduction.

The potential vegetation is about 90% grasses or grass-like plants, 5% forbs, and 5% shrubs. The dominant grasses include sand bluestem, prairie sandreed, little bluestem and needlegrasses. Other grasses present include sand dropseed, switchgrass and prairie junegrass. The dominant forbs include western ragweed and spiny phlox, with less dominant forbs including gayfeather and green sagewort. The shrubs present on this plant community include rose, leadplant and western sandcherry. Plant diversity has decreased and native plants tend to occur in individual colonies. This plant community has a high amount of litter covering the soil between widely dispersed mature plants.



This plant community will change rapidly if plant manipulation is allowed to occur (grazing by domestic livestock or possibly periodic fire). If the intensity and duration of the disturbance is not great enough, it will return to this plant community somewhat easily. Soil erosion is low, and infiltration and runoff are not significantly different than the Bluestem/Prairie Sandreed/Needlegrass Plant Community.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6536

Growth curve name: Nebraska/South Dakota Sandhills, Native Grasslands, Non-Use

Growth curve description: Warm-season dominant, cool-season subdominant, excessive litter.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	5	15	30	30	10	5	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing or prescribed grazing with fire will convert the plant community to the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*. Depending on the length of time non-use occurred and the composition of the plant species prior to removal of use and/or fire, these practices will move this plant community to the *Bluestem/Prairie Sandreed/Needlegrass Plant Community* or the *Bluestem/Prairie Sandreed Plant Community*.
- Heavy grazing or improper rest periods will convert this plant community to the *Prairie Sandreed/Ragweed Plant Community*. This change will be accelerated if coupled with several years of below average precipitation.
- Multi-year continuous heavy use will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### **Gramma/Sedge Sod Plant Community**

This plant community developed under an improperly managed rotational grazing system, consisting of multiple occupations and an inadequate recovery period during the growing season. While this is not a frequently occurring plant community, it needs to be recognized that improperly managed intensive systems will lead to a modified plant community. It is made up of warm-season short grasses, and cool-season grasses and grass-likes. The dominant grass is blue grama. Other grasses or grass-likes include hairy grama, sedges, sand dropseed, sand bluestem, prairie sandreed, needleandthread, and switchgrass. The dominant forbs include western ragweed and annual sunflower. The dominant shrubs include rose and cactus. Compared to the Bluestem/Prairie Sandreed/Needlegrass Plant Community, blue grama, hairy grama, sedges, ragweed and rose have increased, while prairie sandreed, sand bluestem and switchgrass have decreased. The plant diversity has decreased from that of the Bluestem/Prairie Sandreed/Needlegrass Plant Community.

This plant community is resistant to change due to a lower percentage of bare ground. Under disturbance, this plant community is also highly resilient. The soil erosion is low. The water cycle is impaired due to a reduction in litter and the potential for higher runoff and decreased infiltration.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6535

Growth curve name: Nebraska/South Dakota Sandhills, Grama

Growth curve description: Warm-season dominant, short grass.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	15	30	25	15	10	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- With long-term prescribed grazing, including adequate recovery periods, this plant community will move through the successional stages leading to the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*. This change will require a long period of time, and may be difficult to attain if the grama sod is extensive.

### Annual/Pioneer Perennial Plant Community

As succession progresses, sandhill muhly, blowout grass and sand bluestem begin to colonize. Sandbur, lemon scurfpea, Texas croton, and annual sunflower begin to come in with prairie sandreed, hairy grama, and rose slowly becoming evident on this plant community.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6537

Growth curve name: Nebraska/South Dakota Sandhills, Annual/Pioneer Perennial

Growth curve description: Short cool season grasses, and cool season annual forbs.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	10	20	30	20	5	5	5	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- With continued disturbance (such as heavy grazing) and/or wildfire, this plant community will move towards the *Active Blowout Plant Community*.
- Under long-term prescribed grazing (10+ years), including adequate rest periods, succession will progress leading to the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*. The slope, aspect, size and relative abundance of perennial plants will influence the rate that change will occur.

### Eastern Redcedar Plant Community

This plant community can develop whenever eastern redcedar is adjacent to the originating plant community, and encroachment of the eastern redcedar occurs. This can occur in areas adjacent to a seed source, such as near windbreaks. With properly managed intensive grazing, encroachment can be prevented. This plant community is made up of trees with a canopy cover of 15% or greater consisting of trees 6 feet or taller. The herbaceous component decreases proportionately in relation to the percent cover of eastern redcedar.

This plant community is resistant to change, and resilient given normal disturbances. In higher canopy cover situations, the soil erosion will increase in relation to most of the plant communities from which this plant community originated. The water cycle is also significantly altered under higher canopies. Infiltration is reduced because of interception of rainfall by the canopy. Runoff is not greatly increased, as the soil is still capable of absorbing the rainfall that reaches the soil surface.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6542

Growth curve name: Nebraska/South Dakota Sandhills, Eastern Redcedar Encroachment

Growth curve description: Closed or nearly closed canopy of eastern redcedar.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	30	25	20	10	5	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- With brush management, followed by prescribed burning and prescribed grazing, succession will progress leading to the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*.

### Active Blowout Plant Community

This plant community can be reached from any other plant community with significant disturbances such as heavy grazing, and repeated wildfire. Large areas of blowing sand result in movement and possible enlargement of the blowout. Evaporation and transpiration are extremely high due to bare ground, lack of litter, fire, and few plants. This plant community is in a low successional stage from poor soil development, fire occurrence and sporadic herbivore use. Sandhill muhly and blowout grass are present due to their drought tolerance.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: NE6538

Growth curve name: Nebraska/South Dakota Sandhills, Active Blowout

Growth curve description: Areas of open, blowing sand and pioneer species.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	0	10	35	30	20	5	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- With prescribed grazing and concentrated short-term animal impact (such as feeding hay on the blowout), this plant community will move to the *Annual/Pioneer Perennial Plant Community*. Establishment of vegetation may be accelerated by broadcast seeding of a temporary cover crop prior to removal of animal impact.

### Go-back Land Plant Community

This plant community can be reached whenever severe mechanical disturbance occurs. The vegetation on this plant community varies greatly, sometimes being dominated by little bluestem, three-awn, sand dropseed, prairie sandreed, maretail, annual sunflower, green sagewort, and/or ragweed. Other plants that occur on this plant community include rose, yucca, sand bluestem, switchgrass, and needleandthread. Compared to the Bluestem/Prairie Sandreed/Needlegrass Plant Community, warm-season natives have decreased. Annual forbs and grasses have become established in the plant community.

This plant community is variable in its resistance to change and is resilient depending on past management practices. Soil erosion is typically evident in low successional stages. The water cycle is not greatly affected.

Many of the areas seeded prior to the 1960's are now dominated by little bluestem.

## **Ecological Site Interpretations**

### **Animal Community – Wildlife Interpretations**

#### **Bluestem/Prairie Sandreed/Needlegrass Plant Community:**

#### **Bluestem/Prairie Sandreed Plant Community:**

#### **Prairie Sandreed/Ragweed Plant Community:**

#### **Excessive Litter Plant Community:**

#### **Grama/Sedge Sod Plant Community:**

#### **Annual/Pioneer Perennial Plant Community:**

#### **Active Blowout Plant Community:**

#### **Eastern Redcedar Plant Community:**

## Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
hairy grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Indian ricegrass	D P U D	N P N D	D P U D	N P N D	N P N D	D P U D	D P U D
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
Missouri goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
purple lovegrass	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	U U U U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
sand bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
sand dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
sand lovegrass	U D D U	N N N N	U D D U	N N N N	N N N N	U D D U	U D D U
sand paspalum	N U U N	N U N N	N U U N	N U N N	N U N N	N U U N	N U U N
sandhill muhly	N U N N	N N N N	N U N N	N N N N	N N N N	D U U D	N U N N
Scribner panicum	U U D U	N U N N	U U D U	N U N N	N U N N	U U D U	U U D U
sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
small soapweed	D N N D	D U U D	D N N D	D U U D	D U U D	D N N D	D U U D
spiderwort	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
stiff sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western sandcherry	D P P D	D U U D	D P P D	P U D P	D U U D	D P P D	P U U P

**N** = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

<sup>†</sup> Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

## Animal Community – Grazing Interpretations

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity* (AUM/acre)
Bluestem/Prairie Sandreed/Needlegrass	2300	0.73
Bluestem/Prairie Sandreed	2000	0.58
Prairie Sandreed/Ragweed	1500	0.43
Excessive Litter	2100	0.58
Gramma/Sedge Sod	-	-
Annual/Pioneer Perennial	500	0.15
Eastern Redcedar	-	-
Active Blowout	-	-

\* Continuous season-long grazing by cattle under average growing conditions.  
If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

## Hydrology Functions

Water is the principal factor limiting forage production on this site. Normal rainfall is 17-22 inches per year. Valentine soils on this site are in Hydrologic Soil Group A (low runoff and high infiltration even when thoroughly wetted). Water transmission through Group A soils is normally greater than 0.30 inches per hour. Runoff is expected to occur only during the most intense storms (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

For the interpretive plant community, rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses such as little bluestem. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present but only cover 1-2% of the soil surface. Overall this site has the appearance of being very stable and productive.

## Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood Products

No appreciable wood products are present on the site.

## Other Products

Seed harvest of native plant species can provide additional income on this site.

## Supporting Information

### Associated Sites

- (065XY034NE) – Choppy Sands 17-22" P.Z.
- (065XY032NE) – Sandy 17-22" P.Z.
- (065XY024NE) – Subirrigated
- (065XY041NE) – Shallow to Gravel 17-25" P.Z.

## Similar Sites

- (065XY034NE) – Choppy Sands 17-22" P.Z.  
[steeper slope; lower production; blowout grass present; shrubs more evident]  
(065XY032NE) – Sandy 17-22" P.Z.  
[slope not as steep; higher production; prairie sandreed dominant]

## Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site include: Dave Cook, Rangeland Management Specialist, NRCS; Dwight Hale, Engineer, NRCS; Sheila Luoma, Resource Conservationist, NRCS; Marla Shelbourn, Rangeland Management Specialist, NRCS; Dave Steffen, Rangeland Management Specialist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	14	1968 – 1983	NE	Cherry, Garden, Keith, Lincoln, Sheridan, Thomas
Ocular Estimates	2	1999	SD	Bennett

## State Correlation

This site has been correlated with South Dakota in MLRA 65.

## Type Locality

**State:** \_\_\_\_\_ **Township:** \_\_\_\_\_ **Latitude:** \_\_\_\_\_  
**County:** \_\_\_\_\_ **Section:** \_\_\_\_\_ **Longitude:** \_\_\_\_\_  
**General Legal Description:** \_\_\_\_\_ **Range:** \_\_\_\_\_ **Is the type locality sensitive? (Y/N):** \_\_\_\_\_

## Field Offices Counties

Ainsworth, NE	Brown, Keya Paha & Rock
Broken Bow, NE	Custer
Martin, SD	Bennett & Shannon
North Platte, NE	Lincoln, Logan & McPherson
Ogallala, NE	Arthur & Keith

## Field Offices Counties

Oshkosh, NE	Garden
Rushville, NE	Sheridan
Thedford, NE	Blaine, Grant, Hooker & Thomas
Valentine, NE	Cherry
White River, SD	Todd

## Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States; 44a – Nebraska Sand Hills.

## Other References

Other references used include: USDA NRCS Water & Climate Center, USDA NRCS National Range and Pasture Handbook, USDA NRCS Soil Surveys from various counties, Atlas of the Sandhills.

## Site Description Approval

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date